Table C: Data Values for the Tag Type Field

Decimal Value	Description
1	Reserved
2	Tag described by the AAR Standard (Current Version), and the ISO Draft International Standard DIS 10374, and the ATA Proposed Standard
3	Reserved
4	Reserved

To code the Tag Type value into the Tag, the decimal value is reduced by one and converted to its base 2 equivalent.

1.3 Owner's Code: The Owner's Code is composed of four (4) letters and can be represented as C1; C2; C3; C4. To code this information in the Tag, the possible letters represented by C1 will be assigned to the following decimal values: A=0, B=1, C=2, ...Z=25. The letters C2, C3 and C4 will be assigned the following values: Blank =0, A=1, B=2, ...Z=26. This code assignment allows for an Owner's Code of less than four characters, with the actual characters left justified, and the remainder of the field padded with blanks.

Conversion from alpha to numeric would involve the following:

1. Determine the numeric equivalent of characters C1 through C4. This will result in four numeric values; N1 through N4.

2. Convert N1 through N4 into one numeric value by using the formula:

   $$\text{Value} = (N1 \times 27^3) + (N2 \times 27^2) + (N3 \times 27) + N4$$

The base 2 equivalent of the decimal number "Value" is stored in the Tag Owner's Code field.

Conversion from a base 2 tag format back to the four letters would involve the following, where "Value" is the decimal equivalent of the base 2 value in the Owner's Code field.

1. $N1 = \text{Value}/27^3$ (integer - drop fractions)

2. $N2 = (\text{Value} - (N1 \times 27^3))/27^2$ (integer)

3. $N3 = (\text{Value} - ((N1 \times 27^3) + (N2 \times 27^2)))/27$ (integer)

4. $N4 = Value - ((N1x27^3) + (N2x27^2) + (N3x27))$

5. Use the letter-to-number assignments referred to above to convert N1 through N4 from a numeric value to its letter equivalent.

1.4 Identification Number: The Identification Number is encoded into the Tag by converting the decimal value from 0 to 999999 to a binary value (a conversion from base 10 to base 2).

1.5 Chassis Type Code: To encode the Chassis Type Code into the Tag, the decimal value from 0 to 15 must be converted to the equivalent base 2 value. Table D presents a description of each type detail code value.

Table D: Data Values for the Chassis Type Code

Value	Description
0	Extendible
1	Straight
2	Combo
3	Beam Slider
4	Rail Compatible Chassis, with integral rail wheels
5	Rail Compatible Chassis, without integral rail wheels
6	Fixed Length Gooseneck
7	Platform
8	Drop Frame
9	Tri-purpose
10-14	Reserved
15	Others/Not Used/Unknown

1.6 Tare Weight: This field indicates the chassis Tare Weight in hundreds of kilograms. To encode the chassis Tare Weight into the Tag, the decimal value from 15 to 77 kilograms must be reduced by decimal 14 then converted to its equivalent base 2 value. A binary value of 0 (zero) indicates a "does not apply" or "unknown" condition.

1.7 Height: The chassis Height is measured from the ground to the top of the rear bolster when the chassis is unladen. To encode the height into the Tag, the decimal value from 40 to 166 centimeters must be reduced by decimal 39 then converted to the equivalent base 2 value. A binary value of "0" (zero) indicates a "does not apply" or "unknown" condition.

1.8 Tandem Width Code: The Tandem Width Code field indicates the nominal width of the chassis tandem, defined as the extreme width spanned by the outside tires of an axle. (The Tandem Width is usually 2.5 to 2.6 meters, e.g., 96 to 102 inches.) To encode the Tandem Width Code into the Tag, use the following table:

Tandem Width	Tandem Width Code Value
Unknown	0
96" (2.5 meters) or less	1
More than 96" (2.5 meters), but not more than 102" (2.6 meters)	2
More than 102" (2.6 meters)	3

The decimal value from the table is converted to its base two equivalent for encoding into the tag.

1.9 Forward Extension: The Forward Extension is the distance from the center of the king-pin to the most forward protrusion on the Chassis. To encode the Forward Extension into the Tag, the decimal value from 30 to 154 centimeters must be reduced by decimal 28, divided by two, then converted to the equivalent base 2 value. A binary value of "0" (zero) indicates a "does not apply" or "unknown" condition.

1.10 Kingpin Setting: The Kingpin Setting is the distance, measured to the nearest even centimeter, from the center of the kingpin forward to the front of the chassis, but excluding any protrusions such as a gooseneck or electrical box. To encode the Kingpin Setting into the Tag, the decimal value from 30 to 154 centimeters must be reduced by decimal 28, divided by two, then converted to the equivalent base 2 value. A binary value of "0" (zero) indicates a "does not apply" or "unknown" condition.

1.11 Axle Spacing: This is the distance between the centers of the rear axles. To encode the tag, the value of 10 to 40 decimeters is reduced by 9 then converted to the equivalent base 2 value. A binary value of "0" (zero) indicates a "does not apply" or "unknown" condition.

1.12 Running Gear Location: This is the distance from the rear of the chassis to the point midway between the two axles. To encode the tag, the value of 13 to 43 decimeters is reduced by 12 then converted to the equivalent base 2 value. If the chassis is a sliding tandem, use the maximum value of 43 decimeters. For beam sliders, use the distance measurement for the Running Gear Location in its normal position. A binary value of "0" (zero) indicates a "does not apply" or "unknown"

1.13 Number of Lengths: This field represents the number of different lengths in which the chassis can be configured. Enter the appropriate binary equivalent of 0 to 7 lengths. Use 7 for 7 or more lengths. A binary value of "0" (zero) indicates a "does not apply" or "unknown" condition.

1.14 Minimum Length: This field indicates the chassis minimum length. The Minimum Length is measured while the chassis is in its fully retracted state. If the chassis is a fixed length, then the Minimum Length simply equals the chassis length. The length field is equivalent to the overall (outside) length of the chassis, including forward protrusions but excluding dock bumpers. To encode the chassis Minimum Length into the Tag, the value from 0 to 2046 centimeters is first divided by two (2), then converted to its equivalent base 2 value. A binary value of "0" (zero) indicates a "does not apply" or "unknown" condition.

1.15 Maximum Length: The Maximum Length of the chassis may be encoded into the Maximum Length/Security field if the user chooses not to use security characters.

If the user does not wish to use security nor indicate the maximum length, then this field shall be filled with binary zeros ("0's").

If the user wishes to encode Maximum Length, this field shall be encoded as the maximum extendible chassis length, measured from the extreme front to the extreme rear of the chassis. The subsequent steps shall be used to encode the decimal value from 0 to 2046 centimeters into the Tag.

1. Convert the maximum length decimal value ($D_3D_2D_1D_0$) to a base 37 number (L_1L_0) as follows (note that only even centimeters are used):

   $E_3E_2E_1E_0 = D_3D_2D_1D_0/2$ (Truncate Remainder to an Integer Result)

   $C = E_3E_2E_1E_0/37$ (Truncate Remainder to an Integer Result)

   $L_1 = C + 1$

   $L_0 = E_3E_2E_1E_0 - (CX37)$ (Truncate Remainder to an Integer Result)

2. Use the following table to convert L_1 and then L_0 into alpha-numeric characters (A_1 and A_0).

L_1 or L_0 Value	A_1 or A_0 Character	L_1 or L_0 Value	A_1 or A_0 Character
0	/	19	I
1	0	20	J
2	1	21	K
3	2	22	L
4	3	23	M
5	4	24	N
6	5	25	O
7	6	26	P
8	7	27	Q
9	8	28	R
10	9	29	S
11	A	30	T
12	B	31	U
13	C	32	V
14	D	33	W
15	E	34	X
16	F	35	Y
17	G	36	Z
18	H		

3. Using the Six-Bit ASCII table presented in Appendix G, find the decimal values associated with the A_1 character and then the A_0 character. Finally, these decimal values must then be converted to corresponding base 2 values.

May 16, 1990

APPENDIX E

A Description of the Tag Data
Format for the Intermodal Container

Subject to revision by the Ocean industry.

1. **Bits Available for General Use**

Fields specified by the Standard are listed in Table A; General Use fields are indicated in bold type. A description of each General Use field is presented in the paragraphs following Table A.

The procedures and definitions of how to measure the containers' physical characteristics specified in Table A are documented by the International Standards Organization.

Table A: Data Field Descriptions for the Container Tag

Entry	Bits Required	Tag Data Sequence	Minimum Value	Maximum Value	Units
Equipment Group Code	**5**	**0-4**	**0**	**31**	**Type Code**
Tag Type	**2**	**5-6**	**1**	**4**	**Type Code**
Owner's Code (Initial)	**19**	**7-25**	**A**	**ZZZZ**	**Alpha**
Identification Number	**20**	**26-45**	**0**	**999999**	**Numeric**
Check Digit	**4**	**46-49**	**0**	**9**	**Numeric**
Length	**11**	**50-59,64**	**0**	**2000**	**Centimeters**
First Check Sum	2	60-61			
Reserved Frame Marker	2	62-63			
Height	**9**	**65-73**	**0**	**500**	**Centimeters**
Width	**7**	**74-80**	**200**	**300**	**Centimeters**
Container Type Code	**7**	**81-87**	**0**	**127**	**Type Code**
Max. Gross Weight	**9**	**88-96**	**45**	**455**	**100's of Kg.**
Tare Weight	**7**	**97-103**	**0**	**91**	**100's of Kg.**
Spare	**2**	**104-105**	**Reserved**		
Security	12	106-117	Reserved for Security or limited Owner's use		
Data Format Code	6	118-123			
Second Check Sum	2	124-125			
Frame Marker	2	126-127			

The fields are arranged in a hierarchical fashion in order to expedite translation and processing by the data processor. It is intended that the data processor will first look at the Data Format Code to determine if the Tag should be decoded or ignored. For example, in some cases the data processor will wish to ignore all Tags except those specified as highway (ATA Standard) or marine intermodal (ISO Standard) Tags.

Once the Data Format Code has been processed, then the data processor will look to the Tag Type to determine the configuration, capabilities, and memory capacity of the Tag. (Note: This field is provided for future use to accommodate new types of Tags which may have different memory or communication capabilities).

Next, the data processor will examine the Equipment Group Code to determine if the tagged equipment is relevant. For example, the processor may ignore, or process differently, non-revenue equipment than it would chassis or containers.

The order in which the remaining fields are processed will be dictated by the particular application.

1.1 Equipment Group Code: This is a numeric field having a value from 0 to 31 that indicates the general type of equipment. A proposed table of values for this field is indicated below. Note that only major categories of equipment types are indicated in this field and other fields are allotted to indicate further details. The Equipment Group Code for a container is decimal 10 (binary 01010).

Table B: Data Values for the Equipment Group Code

Value	Description	Value	Description
0	Other	16	Reserved
1	Reserved	17	Tractor (Power Only)
2	Reserved	18	Truck (Power and Cargo Bed)
3	Reserved	19	Railcar
4	Reserved	20	Dolly
5	Locomotive	21	Trailer
6	End-of-Train Device	22	Reserved
7	Reserved	23	Reserved
8	Reserved	24	Reserved
9	Reserved	25	Reserved
10	Intermodal Container	26	Reserved
11	Reserved	27	Chassis
12	Reserved	28	Reserved
13	Reserved	29	Reserved
14	Non-Revenue	30	Reserved
15	Reserved	31	Reserved

1.2 Tag Type: The Tag Type indicates the configuration, capability, and memory size of the Tag. At the present time there is only one Tag Type defined, as indicated in Table C.

Table C: Data Values for the Tag Type Field

Decimal Value	Description
1	Reserved
2	Tag described by the AAR Standard (Current Version), the ISO Draft International Standard DIS 10374, and the Proposed ATA Standard
3	Reserved
4	Reserved

To code the Tag Type value into the Tag, the decimal value is reduced by one and converted to its base 2 equivalent.

1.3 Owner's Code: The Owner's Code is composed of four letters and can be represented as C1; C2; C3; C4. To code this information in the Tag, the possible letters represented by C1 will be assigned to the following decimal values: A=0, B=1, C=2, ...Z=25. The letters C2, C3 and C4 will be assigned the following values: Blank =0, A=1, B=2, ...Z=26. This code assignment allows for a Owner's Code of less than four characters, with the actual characters left justified, and the remainder of the field padded with blanks.

Conversion from alpha to numeric would involve the following:

1. Determine the numeric equivalent of characters C1 through C4. This will result in four numeric values; N1 through N4.

2. Convert N1 through N4 into one numeric value by using the formula:

$$\text{Value} = (N1 \times 27^3) + (N2 \times 27^2) + (N3 \times 27) + N4$$

The base 2 equivalent of the decimal number "Value" is stored in the Tag's Owner's Code field.

Conversion from a base 2 tag format back to the four letters would involve the following, where "Value" is the decimal equivalent of the base 2 value in the Owner's Code field.

1. $N1 = \text{Value}/27^3$ (integer - drop fractions)

2. $N2 = (\text{Value} - (N1 \times 27^3))/27^2$ (integer)

3. $N3 = (\text{Value} - ((N1 \times 27^3) + (N2 \times 27^2)))/27$ (integer)

4. $N4 = \text{Value} - ((N1 \times 27^3) + (N2 \times 27^2) + (N3 \times 27))$

5. Use the letter-to-number assignments referred to above to convert N1 through N4 from a numeric value to its letter equivalent.

1.4 Identification Number: The Identification Number is encoded into the Tag by converting the decimal value from 0 to 999999 to a binary value (a conversion from base 10 to base 2).

1.5 Check Digit: The Check Digit is used as a means of verifying the accuracy of the Owner's Code and Identification Number. The Check Digit is calculated according to an algorithm specified in the International Standards Organization Document 6346: 1984. The Check Digit is encoded into the Tag by converting the decimal value from 0 to 9 to its equivalent base 2 value.

1.6 Length: To encode the Length into the Tag, the decimal value from 0 to 2000 centimeters must be converted to the equivalent base 2 value. The Length is equal to the overall (outside) length of the container.

1.7 Height: This field indicates the container height in centimeters. To encode the container Height into the Tag, the decimal value from 0 to 500 centimeters must be converted to its equivalent base 2 value.

1.8 Width: This field indicates the container width in centimeters. The Width is equivalent to the overall (outside) width of the container. To encode the Width into the Tag, the decimal value from 200 to 300 centimeters is reduced by 200 then converted to its equivalent base 2 value.

1.9 Container Type Code: The Container Type Code is represented by the decimal values from 0 to 127 as defined in the International Standards Organization document ISO 6346-1984 (E), Annex G. To encode the value into the Tag, the decimal value must be converted to its equivalent base 2 value.

1.10 Maximum Gross Weight: The Maximum Gross Weight is measured in 100's of kilograms. To encode the Maximum Gross Weight into the Tag, the decimal value from 45 to 455 must be reduced by decimal 45 then converted to the equivalent base 2 value.

1.11 Tare Weight: The Tare Weight field is indicated in 100's of kilograms. To encode the Tare Weight into the Tag, the decimal value from 0 to 91 is converted to the equivalent base 2 value.

APPENDIX F

7-Bit ASCII Table

7-Bit ASCII Table

Graphic or Control	ASCII Decimal
NUL	0
SOH	1
STX	2
ETX	3
EOT	4
ENQ	5
ACK	6
BEL	7
BS	8
HT	9
LF	10
VT	11
FF	12
CR	13
SO	14
SI	I5
DLE	16
DC1 (X-ON)	17
DC2 (TAPE)	18
DC3 (X-OFF)	19
CD4 (TAPE)	20
NAK	21
SYN	22
ETB	23
CAN	24
EM	25
SUB	26
ESC	27
FS	28
GS	29
RS	30
US	31
SP	32
!	33
"	34
#	35
$	36
%	37
&	38
'	39
(	40
)	41
*	42
+	43

Graphic or Control	ASCII Decimal
,	44
-	45
.	46
/	47
0	48
1	49
2	50
3	51
4	52
5	53
6	54
7	55
8	56
9	57
:	58
;	59
<	60
=	61
>	62
?	63
@	64
A	65
B	66
C	67
D	68
E	69
F	70
G	71
H	72
I	73
J	74
K	75
L	76
M	77
N	78
O	79
P	80
Q	81
R	82
S	83
T	84
U	85
V	86
W	87
X	88

Graphic or Control	ASCII Decimal
Y	89
Z	90
[	91
\	92
]	93
^(↑)	94
_(←)	95
`	96
a	97
b	98
c	99
d	100
e	101
f	102
g	103
h	104
i	105
j	106
k	107
l	108
m	109
n	110
o	111
p	112
q	113
r	114
s	115
t	116
u	117
v	118
w	119
x	120
y	121
z	122
{	123
|	124
} (Alt Mode)	125
≈	126
DEL (Rub Out)	127

May 16, 1990

APPENDIX G

6-Bit ASCII Table

May 16, 1990

6-Bit ASCII Table

Six-Bit ASCII Character	Decimal Value	Six-Bit ASCII Character	Decimal Value	Six-Bit ASCII Character	Decimal Value
(space)	0	6	22	L	44
!	1	7	23	M	45
"	2	8	24	N	46
#	3	9	25	0	47
$	4	:	26	P	48
%	5	;	27	Q	49
&	6	<	28	R	50
'	7	=	29	S	51
(	8	>	30	T	52
)	9	?	31	U	53
*	10	@	32	V	54
+	11	A	33	W	55
,	12	B	34	X	56
-	13	C	35	Y	57
.	14	D	36	Z	58
/	15	E	37	[	59
0	16	F	38	\	60
1	17	G	39	]	61
2	18	H	40	^	62
3	19	I	41	_(underline)	63
4	20	J	42		